Amendments to the Drawings:

The attached sheets of drawings includes changes to Figs. 3 and 4. These sheets, replace the original sheets including Figs. 3 and 4, removing the "Prior Art" legend.

Attachment: Replacement Sheets
Annotated Sheets Showing Changes

REMARKS/ARGUMENTS

Claims 1-8, 10, 11 and 13-15 are pending in this application. Independent claims 1, 10 and 15 have been amended. Claims 9 and 12 have been canceled.

A new, more descriptive title has been added. The drawings have been corrected to remove the erroneous prior art legend for Figs. 3 and 4 as noted by the Examiner. Claims 11 and 12 were erroneously dependent on claim 9, as noted by the Examiner. Claim 11 has been amended and claim 12 has been canceled.

All the claims have been amended to specify that the light source is spatially incoherent (light source containing more than one light emitting point), as opposed to spatially coherent such as a laser. In a preferred embodiment, the incoherent light source is an LED, which emits light from an extend area of a semiconductor device. The inventor has invented a way to do position detection of a moving grating using amplitude grating (as opposed to phase grating) that can use an LED, which is cheaper than a laser (see, e.g., Huber col. 1, lines 45-49, which shows he is using phase grating and the principle of diffraction). Additionally, the invention shows specifically how to determine the period of the grating from the relative distances between the gratings.

All the prior art cited in the office action describe a device based on principle of diffraction , which requires a coherent light source (laser). Although, as noted in the office action, Huber mentions an LED, the description nowhere shows how to make it work since phase diffraction is required. Phase diffraction relies on canceling the 0 order beam, which Huber does (see, e.g., col. 2, lines 62-64 and col. 3, lines 60-66).

The independent claims have also all been amended to set forth that the periods of the reference and moving gratings are related by the formula $\frac{1}{T}+\frac{1}{T_r}=\frac{1}{T_s}$. None of the cited references show this relationship, which enables spatial diffraction to work in the invention. The office action says this formula is shown in Huber, col. 2, lines 41-56, in view of Fig. 4, saying the grating appear to have the same period. However, the gratings having the same period does not satisfy the formula. The referenced text of Huber says the period of the scanning grating TP2 (the reference grating) is twice the period of the scale grating TP1. Although Fig. 4 and

accompanying text show that the scanning grating can be two gratings with two periods, the relationship of those periods is not set forth, and certainly the relationship between the 3 gratings of the above formula, now in all the claims, is not described.

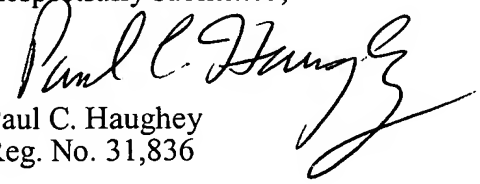
None of the other prior art show this formula. Aoki (6,791,699) and Speckbacher (6,486,467) use identical grating periods. Holzapfel (6,175,414) also doesn't show the formula, and is actually directed to sensing the start position using a correlation signal, not providing an encoder device which generates a sinusoidal signal continuously.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



Paul C. Haughey
Reg. No. 31,836

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 415-576-0200
Fax: 415-576-0300
Attachments
PCH:rgy
60659091 v1

OIPE IAP69
DEC 19 2005
PATENT & TRADEMARK OFFICE

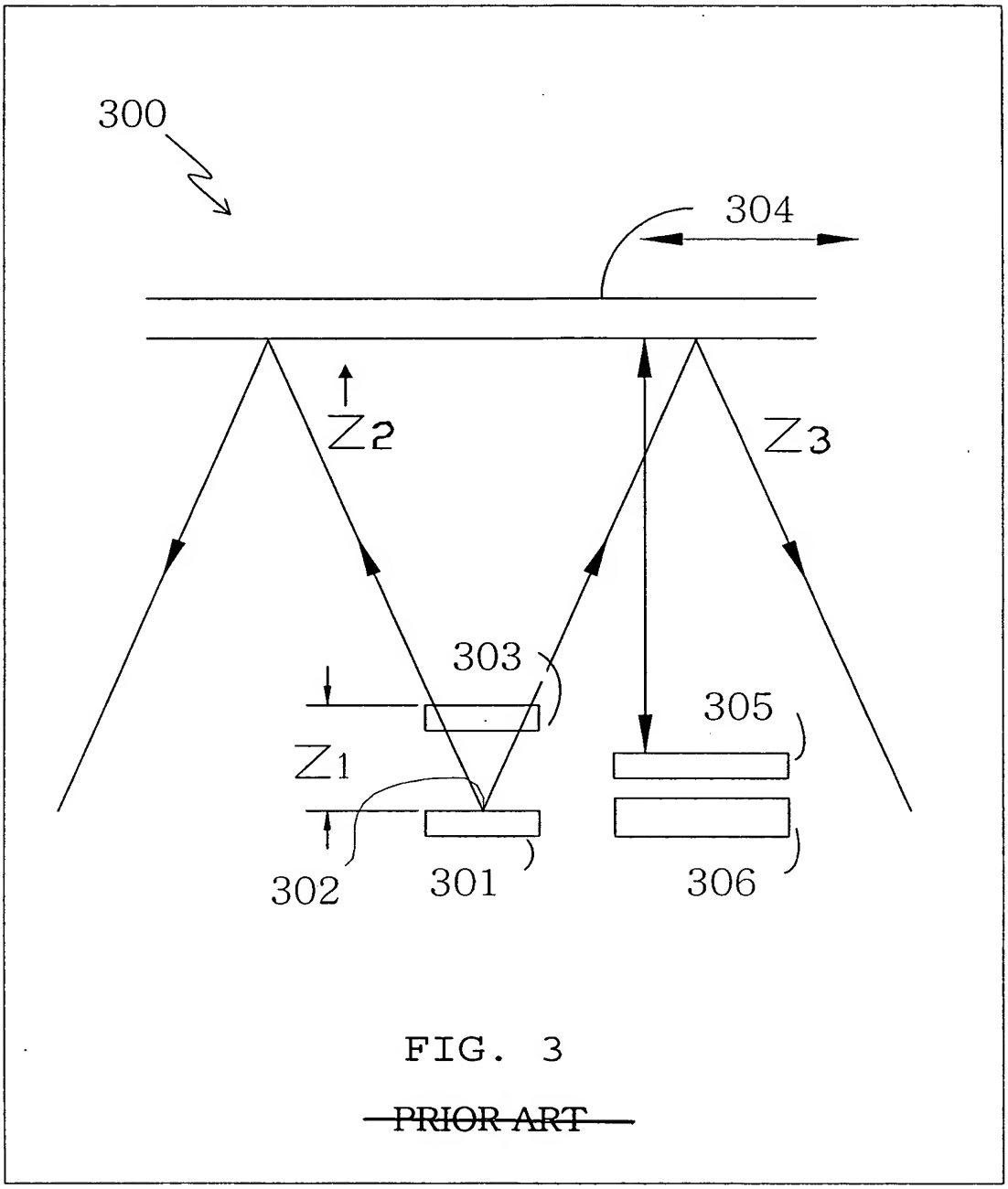


FIG. 3

~~PRIOR ART~~

OIPE IAP69
DEC 19 2005
PATENT & TRADEMARK OFFICE

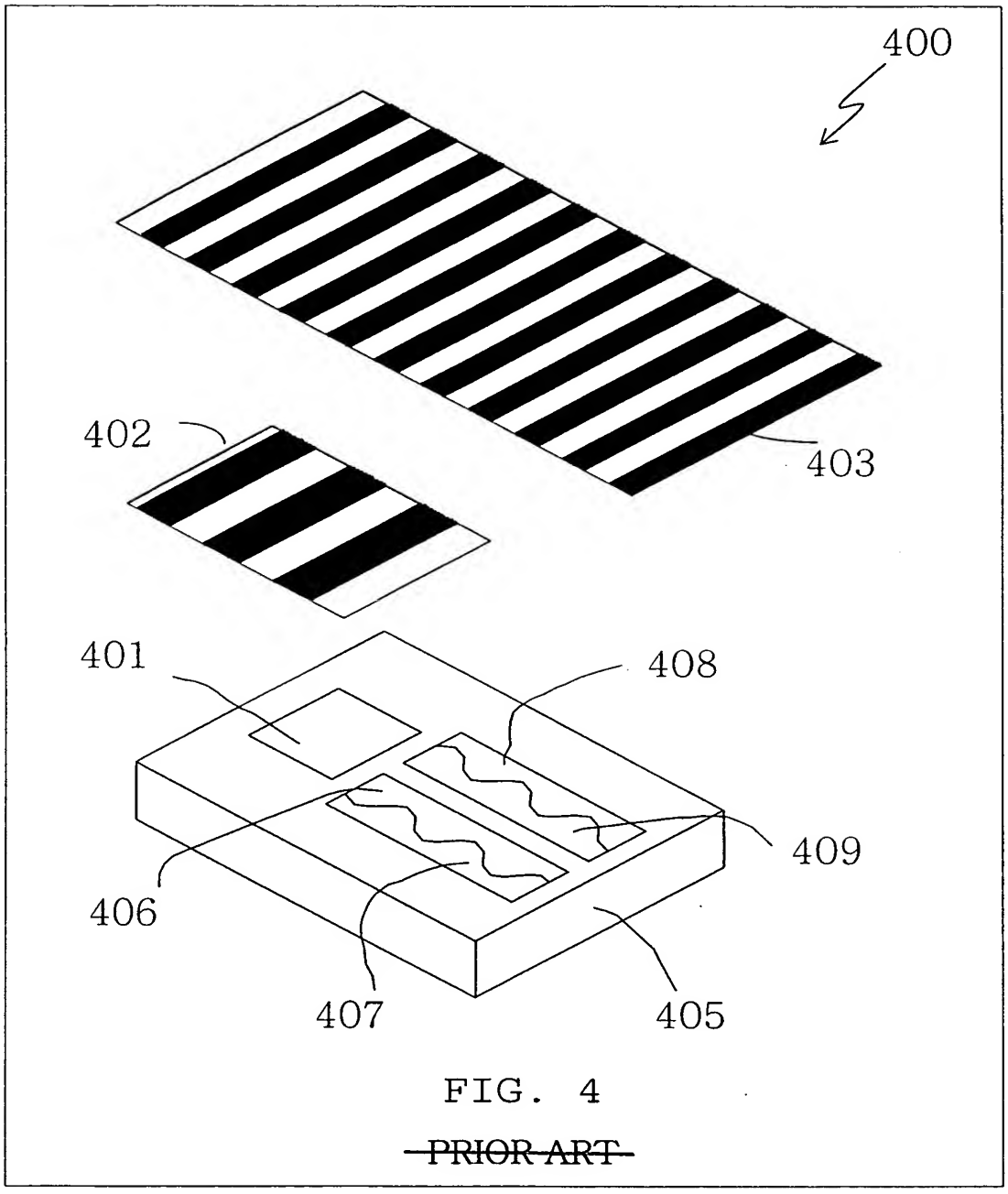


FIG. 4

~~PRIOR ART~~